

# The Outlook for Ethanol Use in California Transportation Fuels – Policy Drivers, Challenges and Opportunities

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## Topics

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- MTBE out: Ethanol in
- Transportation Fuel Supply and Demand Outlook
- Policy Drivers
- Projected U. S. Ethanol Supply
- Projected California Ethanol Demand
- Uncertainties and Challenges
- California Ethanol Information



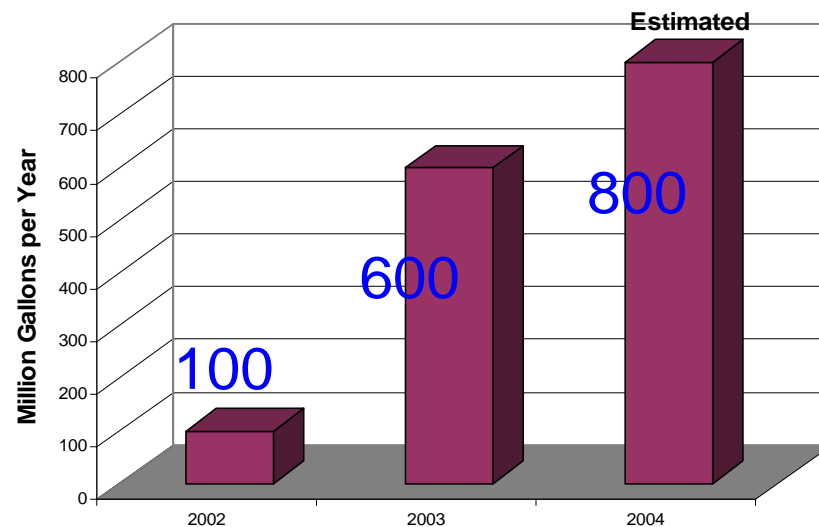
## Background

- **March 1999 Governor's Executive Order bans MTBE use in California gasoline effective January 1, 2003**
  - **Energy Commission to evaluate Biomass-to-Ethanol fuel potential in California**
  - **Environmental review process for ethanol initiated**
- **December 1999 Air Resources Board adopts California reformulated gasoline with ethanol.**
  - **California Environmental Policy Council approves ethanol as a substitute for MTBE**
- **March 2002 Governor delays MTBE ban to January 1, 2004**

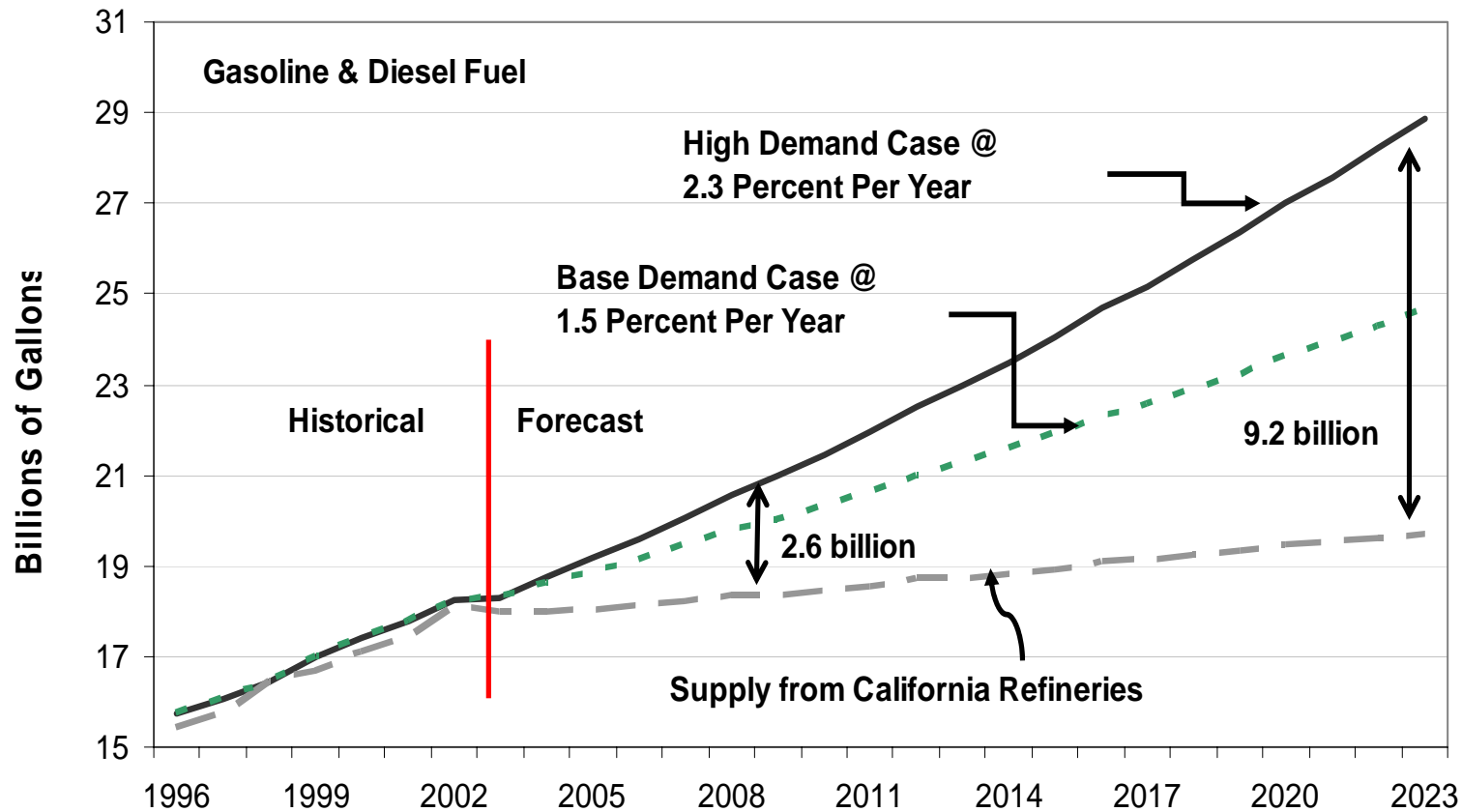


## MTBE Phase-out and Ethanol Substitution

- In 2002 Union 76 (ConocoPhillips) offered California reformulated gasoline with ethanol (CaRFG3)
- Use of CaRFG2 (with MTBE) declined as refiners shifted production in late 2002 and 2003
- Over 60 terminals upgraded to store and blend ethanol into “CARBOB” at the rack
- CaRFG2 completely phased-out by all oil companies by January 1, 2004



# Transportation Fuel Supply and Demand



## Policy Drivers - Energy Commission Transportation Fuel Goals

1. Reduce Demand for on-road gasoline and diesel 15 % below the 2003 level by 2020 and maintain that level for the foreseeable future.
2. Increase the use of non-petroleum fuels to 20 % by 2020 and 30 % by 2030.

*Source: 2003 Integrated Energy Policy Report (IEPR) –  
California Energy Commission*



## Opportunities for Greater Use of Biofuels in California

- Growing demand
- Adequate supplies of ethanol now
- Diverse agriculture sources and cellulosic wastes to make ethanol
- All gasoline vehicles capable of operating on E10
- Growing population of E-85 fuel flexible vehicles (FFVs)
- Ethanol/diesel blends
- Fuel cell applications
- Climate change benefits



## Alternative Fuel Working Groups

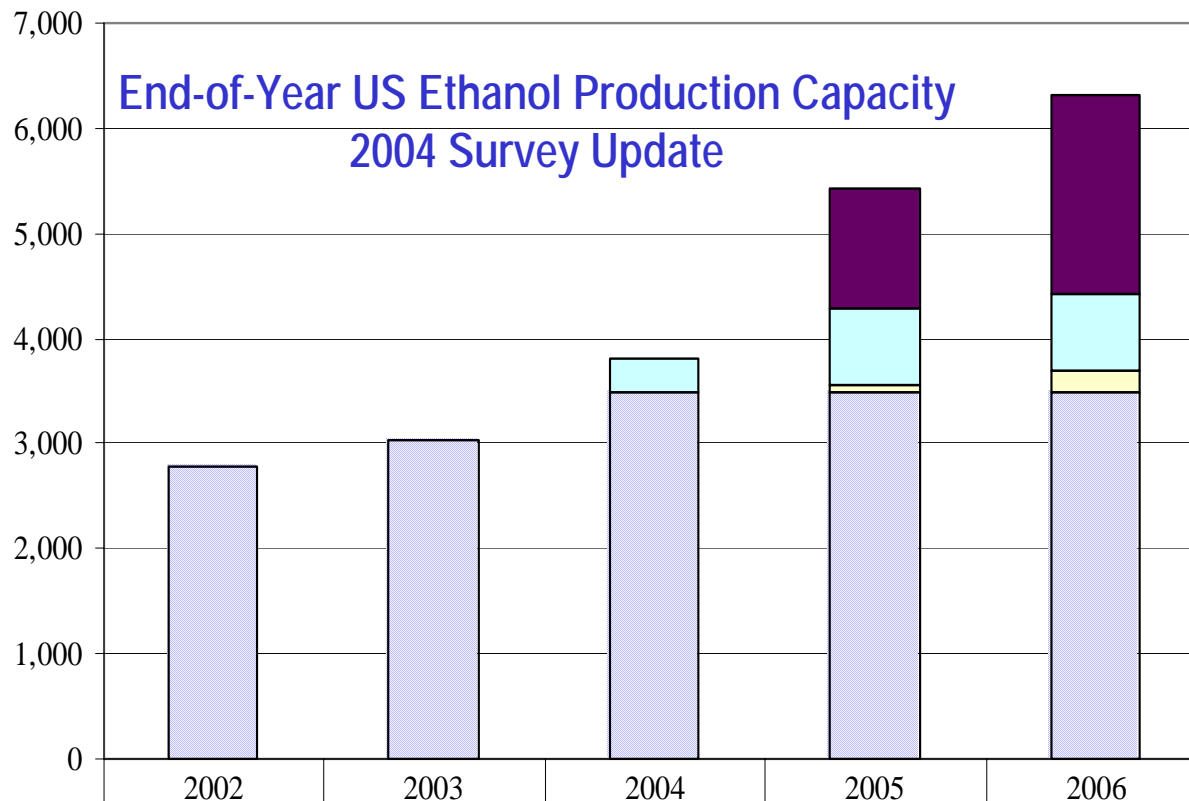
- **Public/Private Collaboratives established to identify barriers and propose actions to achieve IEPR non-petroleum fuel use goals**
  - Ethanol
  - Biodiesel
  - Propane
  - Hydrogen/electric
  - Gas-to-Liquids (GTLs)
  - Natural gas





# Ethanol Supply and Demand Outlook

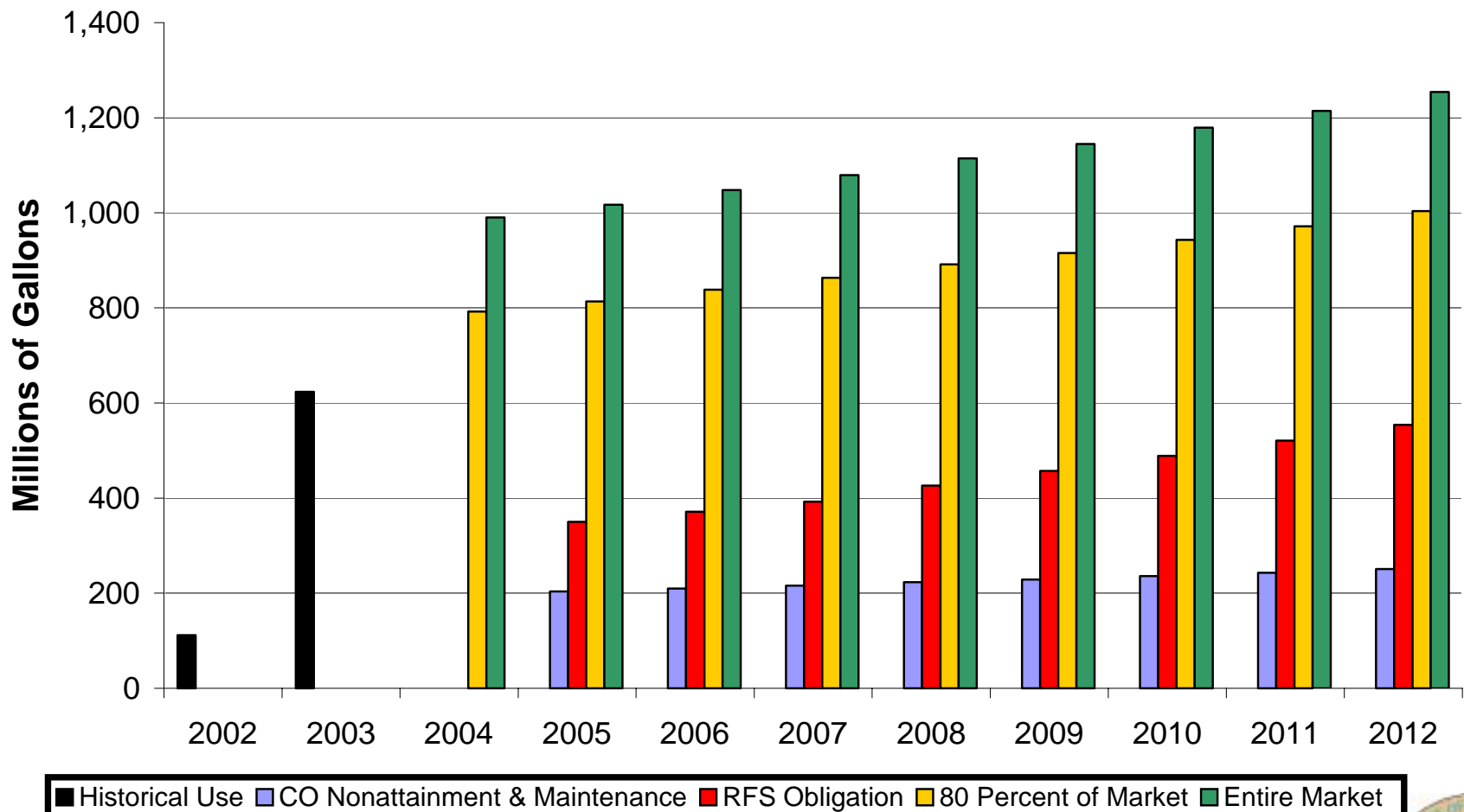
Million Gallons Per Year



Planned			0	1150.5	1904
Under Construction			330	730	730
Existing Expansions			0	62	201
Existing	2773	3041	3486	3486	3486



## Projected California Ethanol Use High Case Gasoline Demand - 3 Percent Per Annum



## Uncertainties and Challenges

- **Federal Renewable Fuels Standard (RFS)?**
- **California's request for waiver from Clean Air Act oxygen requirements (refinery flexibility)**
- **VOC permeation emissions from hoses and fuel system components in vehicles**
- **NOx emissions may increase above 6% ethanol**
- **E- 85 availability for fleets and consumers**
- **Production of Fuel Flexible Vehicles (FFVs)**
- **Cost to commercialize biomass and biomass wastes-to-ethanol**



## For More Information

- California Energy Commission Websites at:
  - [www.energy.ca.gov/ethanol](http://www.energy.ca.gov/ethanol)
  - [www.energy.ca.gov/pier/renew/ethanol](http://www.energy.ca.gov/pier/renew/ethanol)
  - [http://www.energy.ca.gov/2003\\_energypolicy/index.html](http://www.energy.ca.gov/2003_energypolicy/index.html)
- Energy Commission Reports
  - *2003 Integrated Energy Policy Report (12/03)*
  - *Ethanol Fuel Incentives Applied in the U.S.- Reviewed from California's Perspective (1/04)*
  - *Ethanol Supply Outlook for California (10/03)*
  - *2002 Update of the U.S. Ethanol Industry Production Capacity Outlook Report (7/02)*
  - *U.S. Ethanol Industry Capacity Outlook (8/01)*
  - *Cost and Benefits of a Biomass-to-Ethanol Production Industry in California (3/01)*
  - *Evaluation of Biomass-to-Ethanol Fuel Potential in California (12/99)*
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